

Cloudflare Workers for Gaming

1. Situation Analysis

The indie gaming industry has been evolving rapidly with the advent of new developer tools emphasizing open-source collaboration and cross-platform functionality due to an increasingly saturated PC marketplace. The increasing opportunities and easy-to-use tools have led to a new wave of indie developers in a highly competitive market of indie and AAA titles; however, many indie titles lack robust testing infrastructure and validation methodologies, putting them at a disadvantage with competitors; moreover, there is no standardized testing software for games. A high volume of buggy content deflates the player's experience, making it hard to capture a stable audience -- Cloudflare Workers for Gaming aims to fix this. Cloudflare's edge network coupled with serverless Workers and a low latency key-value database offers the perfect delivery mechanism for a standardized Beta-Testing service to easily integrate with a developer's project. Cloudflare's unique specialty in serverless code deployment allows for a robust, scalable, and easy to implement APIs that eliminate the need for an intensive back-end testing development. This allows developers to easily access data, organize, and debug their projects with access to specialized worker tools for testing stages. By eliminating the complexities of constructing a testing environment, Cloudflare allows developers to prioritize customer needs and shifts the focus on production validation and feedback to produce high-quality, profitable titles.

2. Market Strategy

The target market is small to medium-sized game companies without robust issue tracking, in-game feedback, or dedicated beta program teams. The organizational structure of such companies leads to multi-tasking within teams without clear leadership; similarly, the tester pools may not be reflective of their target user persona or responsive. In fact, 90% of developers implement beta testing but receive feedback from only 30% of testers. Another market challenge is the growing emphasis on cloud gaming due to advances in streaming technologies and bandwidth capabilities which creates a resource-intensive testing environment; by integrating the beta testing service with Cloudflare's robust CDN, developers will have access to premium streaming features, communication tools, and scalable load capacity in future developments of the gaming service. To best serve the target market, qualitative data is needed regarding customer and internal team communication methods, testing management practices, debugging tools, and feedback collection to design specialized functionality between developers and testers. Moreover, analyzing data collection practices allows Cloudflare to develop easily deployable templates for organizational purposes for Workers KV. Ultimately, small and mid-sized companies need a way to manage their Beta Testing goals because it is expensive and time-consuming to dedicate resources to testing methodology and techniques.

3. Product Functionality

Cloudflare Workers for Gaming delivers value to its users by providing a centralized platform to easily manage, alter, and collaborate on beta testing. Most importantly, developers need a low latency mechanism to transfer data between players and the development team; thus, an eventually consistent KV database is ideal to maintain across the testing network. The

service itself has four testing modes; each Worker's specialized functionality depends on the services they can perform based on their respective testing mode. The user creates testing, beta, and staging/production environments using the Cloudflare Dash and API. The user can then simply switch between them using Worker Environments. These modes are:

Development mode- This is the environment for developers only to adjust debugging and data protocols. *This is a testing environment for the team developing the game.*

Staging mode- Developers are able to adjust and configure data management feedback with Workers KV, as well as preview in-game UI and functionality for testers. *This is identical to the production environment, except solely for making sure that rolling out a new version goes as expected.*

Beta mode- Developers and testers interact at this stage, and the game servers are live. Includes an API endpoint for feedback sent to Workers by testers, which forward data to the KV database. The developers can then use their own queries to read the data or use the dashboard to fetch data. Game versions are also grouped by their associated feedback logs, and Workers can be deployed to organize feedback by type. Developers can deploy bots for automated testing as well. *This stage is for making it easier than ever to enable developers to collect user feedback from their game.*

Full Production- If the game is asynchronous, developers will have the option of implementing a highly optimized server architecture for asynchronous multiplayer. *This stage is a highly-optimized deployment mode engineered for serving the game to a live audience.*

Success Metrics:

A production KPI to measure is team efficiency in the service's goal of reducing complexity and enabling streamlined testing at optimal workloads without hardware. This goal can be met with detailed API documentation that is consistent with the existing Cloudflare Worker documentation format. Another vital KPI is consistency with the standard Cloudflare Workers service; users familiar with the existing Cloudflare Workers product should be able to adopt the new testing service easily. Other quantitative metrics include accuracy in feedback organization, latency in data transfer to worker KV, and cycle time of bugs to measure the utility of the service for developers in testing.

Summary:

Cloudflare Workers for Gaming enables small teams to iterate testing quickly and focus on optimizing game features to maximize user retention. One of the minor setbacks currently with the KV database being eventually consistent is that syncing between edge locations can take up to 60 seconds; workers KV can be optimized by having a high write, medium read for real-time sync. However, automatically switching between database performance presets unnecessary complexity, and should be manually controlled to prevent unpredictable slowdowns. A major future improvement that comes with utilizing Cloudflare's CDN is the ability for developers to choose between only implementing the Beta-Test service in their game or also hosting their game on Cloudflare's CDN in full production mode, taking advantage of low latency with Argo smart routing. However, synchronous multiplayer in cloud gaming can present a challenge with exceeding bandwidth limitations and performance.

